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Procedia Economics and Finance 22 (2015) 323 – 332

Procedia Economics and Finance

www.elsevier.com/locate/procedia

2nd International Conference 'Economic Scientific Research - Theoretical, Empirical and Practical Approaches', ESPERA 2014, 13-14 November 2014, Bucharest, Romania

Structural Changes Produced in the Romanian Manufacturing Industry in the Last Two Decades

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Abstract

The article deals with the structural changes induced, in the period 1990-2011, in the structure of the Romanian economy and the manufacturing industry, highlighting the positive and adverse effects of these developments on the industrial sectors. The analysis was deepened in relation to some relevant criteria for assessing industrial sectors – technological level, skill level of the labor force, growth rate, energy efficiency - allowing, finally, to draw conclusions on the quality of the structural changes produced: their low amplitude relative to requirements; poor exploiting competitive advantages presented by some sectors; the beneficial effects of integration into the European Union.

Selection and/or peer-review under responsibility of the Scientific Committee of ESPERA 2014

Keywords: industrial structure; industrial sector; techological level; skill level of workforce; sector growth rate; energy intensity;

1. Introduction

The purpose of this paper is to highlight the magnitude and direction of structural changes in the Romanian economy and, especially, manufacturing industry, at the level of its component sectors, overall and in relation to some relevant criteria for assessing the changes recorded - technological level, skill level of the labour force, growth

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Selection and/or peer-review under responsibility of the Scientific Committee of ESPERA 2014
doi:10.1016/S2212-5671(15)00296-8

rate, energy intensity - , in order to finally draw conclusions on the main aspects of the changes registered.

2. Changes in the economy and manufacturing structure since 1990

In the preliminary period 2004-2008 of financial and economic crisis, the Romanian economy and industry experienced considerable growth rates, economy 2.08 times in current prices, and industry 1.91 times in the same prices. The crisis unleashed in 2008 and started in Romania since 2009 had effects felt harder by Romanian economy compared to the situation of most member countries of the European Union, highlighting the fragile foundations of mentioned increases and their reverse faces - increasing current account deficit (the peak reached in 2007 - 13.4%), decisive contribution of the consumption growth, favoured by easiness of granting bank loans, value added increasing faster in sectors that benefited from favourable circumstances and couldn't contribute to sustainable growth (construction, real estate). In other words, the crisis has clearly demonstrated that for achieving long-term sustainable development in the Romanian economy and industry is urgently necessary to change their current structure and focus development on innovation and competitiveness.

Deep structural changes are tantamount to a true re-industrialization of the country, which means, in accordance with the Europe 2020 strategy, intensive support, through appropriate orientation of investment, of development of sectors capable of providing substantial value added increases, with low energy and materials consuming, technologically intensive and, therefore, demanding in terms of the skills of the workforce.

After intense forced industrialization effort made during the planned economy regime, since 1990 the industry heavily stinted in the national economy, a trend demonstrated by the reduction of its contribution to GDP in favour, preponderantly, to services, developments presented in the following figure.

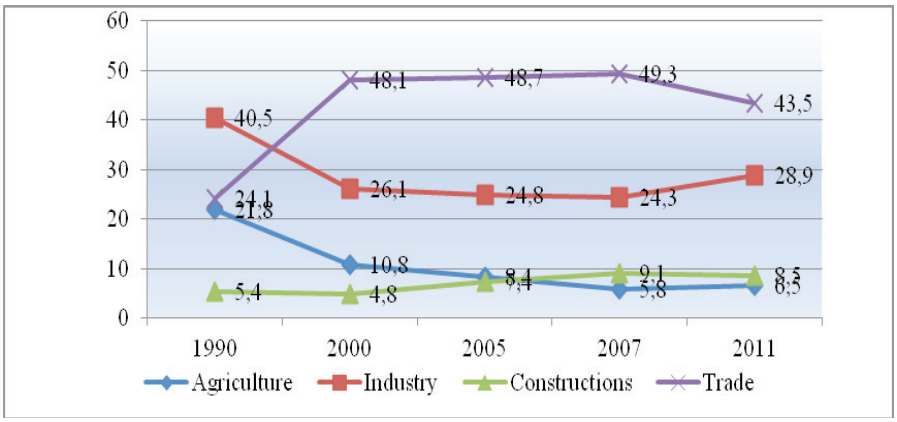


Fig. 1. Share of main economic sectors contribution to GDP, 1990 - 2011 (%)

Decrease by more than 14 percentage points in industry contribution to GDP, during the period 1990-2000, was the peremptory argument of demonstration of marked de-industrialization process knew by Romania, materialized in the bankruptcy of most large industrial enterprises, ceasing manufacture of important products for national economy and competitive on the international markets (Diesel electric locomotives, electric motors of different power, tractors, rigs, etc.), loss of consolidated production chains in horizontal industry. The share of industry in GDP has continued, during pre-accession period to the European Union, to diminish in more relaxed pace, after 2007 that percentage growing significantly till 2011, a trend driven by strong growth in exports to which the industry had a crucial role. Steep decline of branches agriculture, forestry and fishing (by 15.3 percentage points between 1990-2009), and industry was made in favour of trade and services, reflecting another characteristic process of the evolution of national economies - that of Romanian economy's slow but continuous increase of third sector share (services). The numbers in the figure also show the gradual increase of taxation, reflected by the increasing share of

product tax and customs duties to GDP - about 8.2% in 1990, 10.2% in 2000, 10.7% in 2005, 11.4 % in 2007, 12.5% in 2011. Reducing the share of industry in GDP, i.e. the share of manufacturing that has an overwhelming share of the total value of industrial production, is part of the drift significantly felt by most member countries of the European Union. Suffice it to recall, in this regard, that in period 1995-2007, the share of manufacturing in GDP recorded negative change of 3.4 percentage points in the EU, 3.9 in France, 3.9 in Italy, 4.7 in the Netherlands, 2.6 in Spain, 2.9 in Sweden, 0.6 in Hungary, etc. (European Commission, 2010; p.57). The only countries that recorded, during that period, positive changes were Austria (0.5 percentage points), Czech Republic - 3.2, Germany - 1.3, Romania - 2.6 (trend explained by the sharp decline during 1990 -2000, followed by a period of slight growth; as a result, in 2007, the share of manufacturing in GDP was 23.8%, more than 6 percentage points compared to the EU average).

Decreasing share of industry in GDP was produced simultaneously with reducing the share of manufacturing in total value of industrial production and structural changes more or less significant in manufacturing, highlighted by the figures shown in the following table. Many of the changes in the share of industrial sectors have ranged among the trends of manufacturing in the EU as a whole; beneficial changes recorded had but reduced amplitudes, there were usually slow paced, did not engender spectacular progress in terms of superior turning to account comparative and competitive advantages, existing and potential, the industrial sectors possess.

Table 1 Structure of industrial production by industrial activities, 1990....2011 (%)

	1990[a]	2000[a]	2005[a]	2007[a]	2011[b]
Manufacturing	85,8	79,4	80,6	80,6	76,0
Food, beverages and tobacco products	14,9	17,6	15,3	14,2	12,7
Textiles products	5,7	2,1	2,1	1,4	1,2
Clothing articles	4,7	3,3	3,3	2,6	2,3
Leather goods and footwear	1,9	1,3	1,5	1,2	1,2
Wood and wooden products manufacturing (except furniture)	1,6	2,5	4,0	3,9	2,6
Pulp, paper and paper products	1,2	1,2	0,8	0,8	0,8
Publishing houses, polygraphy and recording reproducible registrations	0,3	1,3	1,4	1,5	0,8
Crude oil processing, coal coking and nuclear fuel treatment	6,9	10,1	12,0	10,3	10,5
Chemical substances and products	7,3	7,0	4,8	4,4	3,7
Rubber and plastic products	2,6	1,7	2,5	3,0	3,6
Manufacturing of construction materials and other products of non metallic minerals	3,5	3,3	3,2	4,0	2,6
Metallurgy	8,5	11,4	9,3	9,3	7,7
Metallic construction and metal products	4,1	2,5	3,3	4,4	3,7
Machinery and equipment (except electrical and optical equipment)	9,3	3,6	3,1	3,1	3,0
IT and office means	0,5	0,2	0,3	0,4	2,7[c]
Electric machinery and appliances	2,5	1,9	2,6	3,5	2,7
Radio, TV and communication equipment	0,8	0,7	0,4	0,8	...
Medical, precision, optical, watchmaking instruments and apparatus	1,1	0,4	0,5	0,5	...
Means of road transport	3,7	2,5	4,6	5,1	9,6
Means of transport not included in road transport	2,3	1,9	2,0	2,3	1,4
Furniture and other industrial activities n.e.c.	2,2	2,3	2,5	2,5	3,2
Waste recovering	0,2	0,6	1,1	1,4	2,6 [d]

Note: a – Divisions CANE Rev. 1; b – Divisions CANE Rev. 2; c – Including radio, TV and communication equipment and Medical, precision, optical, watchmaking instruments and apparatus; d – Activity integrated into water supply, sewerage, waste management, and decontamination activities
Source: Romanian Statistical Yearbook, issues 2011 ºi 2012, National Institute of Statistics, Bucharest, Table 16.2.

Depending on the magnitude of the structural changes registered, during the period 1990-2011, by the industries weights in industrial output value, they can be ranked as follows:

- **Sectors with significant weight increase** (130%) – Publishing houses, polygraphy and recording reproducible registrations, Means of road transport, Wood and wooden products manufacturing (except furniture), Crude oil processing, coal coking and nuclear fuel treatment, Furniture and other industrial activities n.e.c., Rubber and plastics products;

- **Sectors with low-growing weight** (130%)– IT and office means, Electric machinery and appliances;

- **Sectors with weight maintained approximately constant** - Radio, TV and communication equipment;

- **Sectors with low-decreasing weight** (30%)- Metallurgy, Metallic constructions and metal products, Food, beverages, and tobacco products, Manufacturing of construction materials and other products of non-metallic minerals;

- **Sectors with significant weight decrease** (30%)- Pulp, paper and paper products, Means of road transport, Chemicals and chemical products, Leather goods and footwear, Clothing articles, Machinery and equipment, Medical, precision, optical, watchmaking instruments and apparatus.

Manufacturing configuration changes, some steep, some indicating certain clearly defined trends and others sinuous, occurred under the influence of many factors, so much so that it is difficult to indicate the cause of the changes for each sector. Analysis of group of sectors according to amplitude of their share change in the value of the industrial production enables the drawing of clear conclusions:

- between sectors with significant increases of their share fall some of high and medium-high tech, which is an encouraging fact for increasing the technicality of the Romanian manufacturing industry, given that between the technological level of an activity and its value added production potential is a direct proportional relationship;

- sectors that have benefited from substantial investment in their upgrading fall among those with the largest increases in their production and, thus, their share of industrial output value; between them stand those from the first mentioned category, with significant increase in their share, the sector of Means of road transport being, by its size and substantial contribution to export, the most illustrative example;

- ranking highlights the unfavorable reality that sectors that have competitive advantages (tradition, factors endowment, domestic and international demand) - Food, beverages and tobacco products, Manufacture of construction materials and other products of non-metallic minerals – registered modest increases in their share, which shows poor still valuing their growth potential;

- between the traditional low-tech sectors only Wood and wooden products manufacturing and Furniture and other industrial activities n.e.c. recorded increases in their share as a result of increased demand for their products in international markets, while other sectors - Leather products and footwear, Clothing articles, Pulp, paper and paper products, Textiles products - heavily reduced their weights, despite their still dominant orientation towards exports.

3. Assessment of structural changes in terms of relevant indicators

Deepening the analysis relative to other criteria for assessment of industrial sectors - namely the technological level, skill level of the labor force, the sector growth rate, and energy intensity - reveals other interesting aspects.

A. Grouping sectors according to their level of technology was made according to the classification adopted by the OECD in four technological levels – high, medium-high, medium-low, and low (OECD,1997). Developments in the period 1990-2011 of the weights of the four groups into which the industrial sectors (activities, according to NACE terminology) were framed, shows that the industry is still far from have the attributes of modernity and efficiency that characterize developed economies.

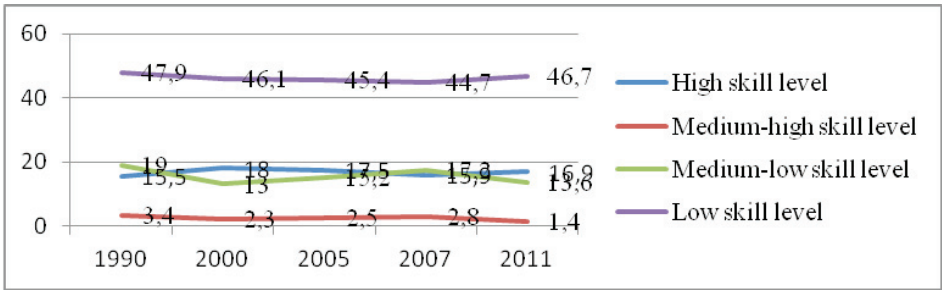
Thus, the high-tech sectors group had, in 2011, a very modest share - 3.4%, after recorded in 2005 a minimum of 2.2%. It is sufficient to remember for comparison that, in 2005, so six years before, the whole EU25 recorded a share of 11.4% of this group, and some countries reported spectacular figures: Ireland - 24.6%, Finland - 22.4%, Sweden - 20.9%, Denmark - 16.8%, France - 13.5%, Germany - 11.8% etc.(European Commission, 2010; p.67) and former communist countries recorded, at the time, levels significantly above Romanian industry - Hungary 18.2%, Slovenia 12.4%, Czech Republic 6.3%, Poland 5.8%.

Group of medium-high technology sectors strongly stinted its share in 1990-2000 period, then increased slowly until 2011, without being able to reach the level it had in 1990 (in 2005 the share of the EU25 was 30.7%, while Romania recorded 16.1%, Hungary 34.6%, Czech Republic 34.9%, Poland 23.1%). In group of medium-low technology sectors, the weights registered in Romanian manufacturing industry approach and even surpass the corresponding values in the EU25; in 2005, the EU25 - 26.2%, Romanian industry - 30.3% (Poland - 33.3%, Czech Republic - 31.0%, Slovenia - 28,5%, Hungary - 24.1%). At last, group of low tech sectors, which had by far the highest share in the period 1990-2005, significantly reduced it later, a salutary fact that highlights the results of very slow process of modernization of the Romanian industry, by reducing progressively the weight of low value-added sectors. Even if the share of this group registered in the Romanian industry by 2011 - 27.4%, well below the EU25 average in 2005 - 31.8%, continues to be high, other countries of the European Union having also reported high weights - France - 32.0%, Denmark - 36.9%, Netherlands - 40.2%, Poland - 38.4%, Czech Republic - 27.8%, etc.

It is evident that, despite the modest progress made by local manufacturing industry, its centre of gravity in terms of technological level is placed in the inferior zone, of medium-low and low technology, groups of the corresponding sectors having an aggregated share over 55% in 2011 (EU25 in 2005-55%); what makes the difference in the manufacturing industry area between Romania and most of the EU countries is share significantly higher of sectors group of high technology (over four times the ratio UE25/Romania in 2005) and medium-high (about 1.3 times the same report).

To establish industrial policy of Romania, the issues raised should determine focusing on further reducing the share of low-technology group, and increasing that of median groups, of medium-high and medium-low technology, where Romanian manufacturing have levels closer to the EU25 averages. This orientation aims at specific sectors where Romania has competitive advantages, has had and could gradually regain or create new advantages - Chemicals and chemical products, Machinery and equipment, Machinery and appliances, Means of road transport, Means of transport not included in road transport, Crude oil processing, Rubber and plastic products, Other non-metallic mineral products, Metallurgy.

B. Reporting manufacturing structure to criterion of the labour force skill levels, shown in the next figure, leads, broadly, to similar conclusions to those resulting from technological level reporting criterion.



Source: Romanian Statistical Yearbook issues 2011 and 2012, NIS, Bucharest, Table 16.2.
Fig. 2.Structure of manufacturing by skill levels of labour force, 1990....2011 (%)

It should be noted that the classification of sectors was made, according to the OECD classification, in different groups with respect to two mentioned criteria. Thus, the Crude oil processing sector is considered medium-low tech but highly skilled; Chemicals and chemical products sector is placed in group medium-high technology and highly skilled group, and Rubber and plastic products sector is medium-low technology and low skills. The differences in the allocation of the same sector to groups corresponding to the two criteria are determined by production organization and degree of production automation (a high degree of automation allows decomposition of the working process into simple operations, that require low skills, although the technological process of production is high).

Share of sectors that require high qualifications varied, between 1990-2011, in a narrow range, the level achieved in Romania in 2011- 16.9%, being significantly below that recorded by the EU25 in 2005 - 39.9% (France - 46.6%, Germany - 41.8%, Poland - 32.2%, Czech Republic - 29.0%, etc.) (European Commission, 2010; p.65). Group of sectors requiring medium-high skills reduced its weight, and so very low, in the same period, reaching 1.4% in 2011 (the EU25 in 2005 - 15.8%). The same reduction in the period under review has seen the share of sectors group requiring medium-low skills, level of this group registered in 2011 - 13.6% being bellow the EU25 one in 2005 - 27.0%. The most unfavourable difference registered as against the situation recorded in most EU member countries is situated in the zone of sectors characterized by low-skilled labour, the share of the group comprising these sectors being in Romania, in 2011, of 46.7%, compared to the EU25 in 2005 - 17.3% (in the same year: France - 14.0%, Germany - 16.2%, Czech Republic - 23.3%, Poland - 21.3%, Hungary - 19.1%, etc.). Such a difference explains, largely, worrying gap in productivity and, hence, competitiveness of Romanian manufacturing to that of most EU member countries, and is likely to shatter the alleged competitive advantage of Romanian labour cheapness.

The Romanian manufacturing industry presents unfavourable differences as against other countries not only in terms of weights of mentioned groups corresponding to the four levels of qualification, but also in terms of the dynamics of these weights. If in the EU unfailing growth trends of the high skills group weight, of moderate growth for medium-high skilled group, of moderate reduction for medium-low and low skills groups are obvious, in Romania respective developments are sinuous and less marked, that proves, once again, that structural changes occurred after 1990 were limited and failed to substantially alter the essential characteristics of the economy and industry - low productivity, low value added, overall modest competitiveness although of some sectors is considerable.

C. The third criterion for assessing structural changes - the growth rate of sectors – reflects the dynamism of their previous developments. Growth rate gives an indication on the more or less intense development, in a long enough period to give the relevance of past developments, but has no marks on the future development of sectors, respectively their chances to maintain, improve or worsen previous rates. The figures in the table below, which reflect the growth indices of the manufacturing sectors in a period of over a decade, show that activities with the highest rates are, in descending order, Manufacture of electrical equipment, Manufacture of road vehicles, Manufacture of rubber and plastic products, Manufacture of wood and wood products, Manufacture of tobacco products, these activities having growth indices above manufacturing average.

Table 2 Industrial production indices, by activities of manufacturing, 2000....2011 (2005=100)

Activity (CANE Rev. 2 divisions)	2000	2005	2007	2011
Manufacturing	97,2	100,0	126,1	136,1
Manufacture of food products	95,8	100,0	129,0	131,2
Manufacture of beverages	82,3	100,0	123,1	112,6
Manufacture of tobacco products	92,0	100,0	115,5	149,6
Manufacture of textiles	117,0	100,0	101,1	78,0
Manufacture of wearing apparel	111,3	100,0	88,8	52,1
Leather products and footwear	105,9	100,0	95,9	66,2
Manufacture of wood and of products of wood	92,9	100,0	133,2	184,1
Manufacture of paper and paper products	86,6	100,0	120,0	106,7
Printing and reproduction of recorded media	45,2	100,0	96,7	96,6
Manufacture of coke and refined petroleum products	73,3	100,0	94,9	73,1
Manufacture of chemicals and chemical products	112,9	100,0	104,7	121,7
Manufacture of basic pharmaceutical products and pharmaceutical preparations	96,5	100,0	108,0	122,3
Manufacture of rubber and plastic products	72,1	100,0	161,8	189,7
Manufacture of other non-metallic mineral products	101,8	100,0	147,4	123,0
Manufacture of basic metals	82,5	100,0	103,1	76,2
Manufacture of fabricated metal products, except machinery and equipment	143,9	100,0	147,0	133,9
Manufacture of computers, electronic and optical products	147,7	100,0	131,2	100,3
Manufacture of electrical equipment	82,7	100,0	140,6	268,2
Manufacture of machinery and equipment n.e.c.	133,8	100,0	135,1	115,7
Manufacture of motor vehicles, trailers and semi-trailers	48,6	100,0	138,9	222,9
Manufacture of other transport equipment	93,7	100,0	128,1	64,3
Manufacture of furniture	81,1	100,0	117,3	92,5
Other manufacturing n.e.c.	143,7	100,0	115,4	76,3
Repair, maintenance and installation of machinery and equipment	95,8	100,0	111,3	119,3

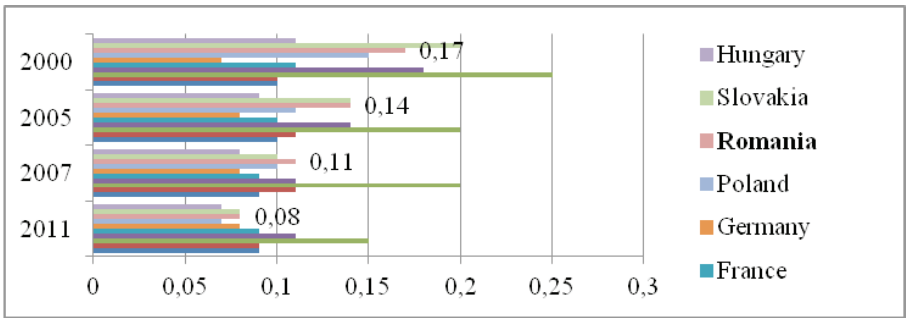
Source: Romanian Statistical Yearbook issues 2011 and 2012, NIS. Bucharest, Table 16.2.

According to this criterion, the picture offered by the top five mentioned sectors is that of a balanced developments, the first two places being occupied by high-intensity technological sectors, which is a encouraging reality that should be continued and enhanced through appropriate provisions of industrial policy. This fact is consistent with that reported for the manufacturing industry of the European Union, where the sectors with the largest increases in 1995-2007 were Electrical and optical equipment, Chemicals, Transport equipment, Rubber and plastic products, Basic metals, Metal products, Machinery and equipment n.e.c., all taking a place above the average growth of the entire Community industry.

At the same time, in addition to salutary performance of Romanian industry outlined above must be also registered other events which follow to be corrected by industrial policy: modest growth rates, far below average, of the sectors Manufacture of machinery and equipment n.e.c., and Manufacture of computers, electronic and optical products; steep decreases registered by the sectors Manufacture of coke and refined petroleum products, and Manufacture of other transport equipment, which before 1990 had potential and notable performances.

D. The fourth criterion mentioned above for assessment of structural changes in the industry - its energy intensity - is the amount of energy consumed to achieve industrial production relative to value added (VA) related to the production concerned. Energy intensity conditions, in significant measure, competitiveness of achieved production by its cost of production.

In Romania, reducing the energy intensity of the industry in the period 2000-2011 was significant, among the highest compared to reductions made in other European Union countries, as shown in the following figure.



Note : The ratio of final energy consumption of industry (Mtoe) and VA measured at constant 2005 PPP (PPP US2005 billion)
Source : World Energy Council, ENERDATA
Fig. 3 . Energy intensity of industry at value added, in some EU member countries, 2000 ... 2011

Reducing energy intensity in most of the countries shown in the figure was made with different rates, during 2000-2011, which were (percent per year): -7.7% Slovakia; -6.4% Poland and Romania; -4.6% Bulgaria and the Czech Republic; -4.4% Hungary; - 1.4% Austria and EU27; +0.9% Germany.

Reduction of more than half of Romanian industry energy intensity is explained, preponderantly, by the strong restriction of productive work, in conditions of bankruptcy and closure of many businesses, some large and from recognized as energy-intensive sectors. Despite the significant reduction of energy intensity in the industry, the share of energy-intensive sectors - whose energy intensity is above the industry average, so are with high and medium-high intensity - continues to remain high, well above the average of other European countries It should be appreciated, however, that the share of energy-intensive sectors of high and medium-high intensity decreased, during the analysed period, by 11.6 percentage points, concomitantly with the corresponding increase in the share of medium-low and low intensity sectors.

Industrial policy will, therefore, provide further actions for restructuring and modernization of industrial production activity in order to reduce overall energy-intensity, and weight of high and medium-high intensity sectors.

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The changes produced in the last two and a half decades in Romanian manufacturing are reflected in variations of industries competitiveness in international markets. Assessment of the international competitiveness of sectors can be done using a range of indicators - openness to the outside, sector presence in the global market, relative trade balance, revealed comparative advantage, sectoral specialization indicator, intra-industry trade indicator (Grubel-Lloyd GL), beneficial structural change index, etc. In previous work we have calculated and interpreted these indicators for Romanian manufacturing sectors compared to the situation for the EU manufacturing industry as a whole and of the member countries (Hornianschi and Russu, 2011; p.66-83). Assessments made by us in light of some of the above indicators generally lead to conclusions consistent with those presented in the documents of the European Commission on this matter, which designate various levels of competitiveness of industrial sectors(Russu, 2013).

For example, by considering indicator of revealed comparative advantage (RCA – compares the share of a given sector export in the country total export with the share of the same sector export in the total export of a group of reference countries) our calculations highlighted that, in trade relations with the EU in 2010, competitive sectors proved to be, in descending order, those corresponding to the following sections of Combined Nomenclature of foreign trade: XII. Footwear, headgear, umbrellas and the like (ACR = 10.74); XI. Textiles and textile articles thereof (4.21); IX. Wood products, excluding Furniture (3,01) ; VIII. Raw hides and skins, leather, furskins and articles thereof (1,95) ; XV. Base metals and articles of base metals (1,41); VII. Plastics, rubber and articles thereof (1,35) ; XVII. Vehicles and associated transport equipment (1,11) ; XVI. Machinery and mechanical appliances; electrical equipment; sound and image recorders and reproducers (1,05). Except for the last two sections,

all other correspond to industrial sectors of medium-low and low technology, with low value added, whose production is in decline in most countries.

These results are, for the most part, consistent with those presented in a document of the European Commission dedicated to the topic in question (European Commission, 2010.a), confirming that the Romanian manufacturing industry has the most emphasized competitive advantages in medium-low technology sectors and, more particularly, low, and less pronounced in two medium-high technology sectors – Motor vehicles and Electric equipment. The sectors with the highest values of ACR are, in descending order, Tobacco, Furniture, Wood and wood products, Leather and footwear, Garments, Printing, Motor vehicles, Rubber and plastic products, Electrical equipment, Metal products, order relatively similar to that shown above. In fact, in some of these sectors most other EU countries also present competitive advantage, which means more competition on the European single market and international markets and, thus, increasing difficulties for the Romanian producers; this concerns, primarily, Rubber and plastics, Non-metallic mineral products, Motor vehicles, Electrical equipment, Wood and wood products, Paper, Metal products, Furniture.

Comparing the situation in Romania with that in other former socialist countries highlights the fact that the latter turned, in a higher proportion than the Romanian producers, to activities characterized by high and medium-high tech and corresponding workforce qualifications. Romanian manufacturing structure – in which the sectors with the highest values of RCA belong, preponderantly, to areas with low value added production -, presents a configuration with peaks of advantages in sectors with modest value added, characteristic, in general, to industry from countries with lower levels of development, that are striving to improve their industrial structure and competitiveness.

Conclusions

- Structural changes which occurred in the Romanian manufacturing industry in the period under review, some welcome, did not have, however, the necessary amplitude to change essentially general attributes of the economy, namely its modest average productivity, lower efficiency and competitiveness proven, preponderant, in traditional sectors who had a strong export orientation in the centralized economy regime;
- In the absence of over two decades of industrial policy thoroughly grounded, formalized and followed consistently, changes occurred as a result, mainly, of investments made by local entrepreneurs but especially trans-national and multi-national foreign companies, who have placed their capital in the most attractive sectors in terms of short and medium term profits, so on other grounds than the requirements of sustainable development and increasing competitiveness of the economy;
- Changes highlighted the existence of sectors with real competitive advantage but increasing shrinking of their share (the traditional ones, competitive at their level of technicality and quality of products, but where there were no noticeable changes in terms of efficiency), sectors with potential competitive insufficiently turned to account (e.g., Food or Manufacture of other non-metallic mineral products), as well as sectors whose advantages began to be capitalized higher in the last years of the analysed period (e.g., Manufacture of electrical equipment, Manufacture of motor vehicles, Manufacture of rubber and plastics);
- After 2007, the year of Romania's integration into the EU, the structural changes beneficial to the manufacturing industry have increased, as an evidence that access to the European Single Market from within the EU ensemble has persuasively proved its effects.

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